

KENTUCKY MESONET

The Kentucky Mesonet: Monitoring Weather and Climate across the Commonwealth

Stuart Foster and Rezaul Mahmood
Kentucky Climate Center
Western Kentucky University

Center for Renewable Energy Research
and Environmental Stewardship
Louisville, Kentucky
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Outline

- Background
- Design
- Instrumentation
- Information technology
- Analysis and modeling

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Observations collected once a day and often not available for four months

Observations collected every 5 minutes, 24 hours a day, 365 days a year and available in near real time

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Mitch McConnell

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INSTITUTE FOR SUSTAINABLE
HOMES

PRESS RELEASES
Senator McConnell Secures \$1.5 Million In Funding For Western Kentucky University from the Office of Senator Mitch McConnell

Thursday, July 13, 2006

*Full Senate 3rd

WASHINGTON, announced today he has approved his request for funding for the Kentucky Climate Center's National Oceanic and Atmospheric Administration (NOAA) Science Appropriations bill.

WESTERN KENTUCKY UNIVERSITY NEWS RELEASE

Kentucky Mesonet Recognized As Official Climate Data Source

April 06, 2006

Gov. Ernie Fletcher has signed a resolution designating the Kentucky Mesonet as the official source of climatological observations for the state.

The Mesonet, a statewide automated environmental monitoring network, is being developed by the Kentucky Climate Center at Western Kentucky University in partnership with the National Oceanic and Atmospheric Administration (NOAA).

Senate Joint Resolution 238, sponsored by Sen. Brett Guthrie of Bowling Green and Sen. Wayne Sanders of Frankfort, was approved 21-0 by the Senate on March 24 and 67-0 by the House on April 4.

"The unanimous votes in the Kentucky Senate and House reflect broad support for the Mesonet and show that our state legislature clearly recognizes the value this project holds for the people of Kentucky," said Press Secretary Sean Foster, director of the Kentucky Climate Center.

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Kentucky Mesonet Status Map

- Active Station (49)
- Installation In Progress (3)
- Installation Scheduled (5)

June 28, 2010

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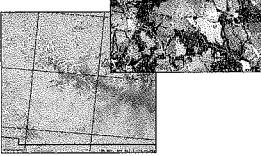
Design Principles

- Quality
- Reliability
- Scalability

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Site Selection Activities

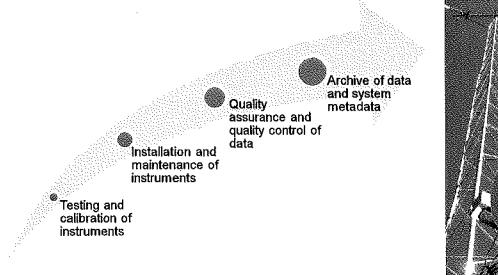
Sites and surveyed and scored based on World Meteorological Organization criteria



Survey Scores	
Temperature	40
Precipitation	30
Wind	12
Soil	15
Total	97

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Vertical Integration



- Testing and calibration of instruments
- Installation and maintenance of instruments
- Quality assurance and quality control of data
- Archive of data and system metadata



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Station Configuration

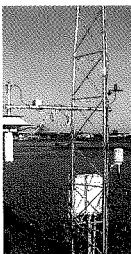
Sensor Package

- Air temperature
- Precipitation
- Wetness
- Solar radiation
- Relative humidity
- Wind speed and direction
- Soil moisture and temperature (selected sites)

Integrated IT Infrastructure

- Datalogger
- Cellular digital modem

"A scalable infrastructure for environmental monitoring that reaches across the Commonwealth"



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Temperature and Precipitation Sensors

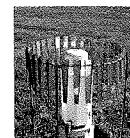
Air Temperature

- Sensors**
 - Thermometrics PRTs
 - Met One aspirated shield
- Quality Control**
 - Redundant sensors
 - Laboratory calibration using Fluke 7380 temperature bath



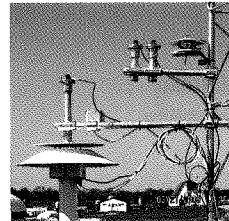
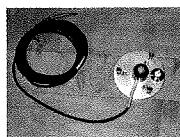
Precipitation

- Sensors**
 - Vaisala VRG101
 - Vaisala DRD11A wetness sensor
- Quality Control**
 - Intelligent rim-heating
 - Alter shield
 - Field calibration using Vaisala calibration kit



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Solar Radiation Monitoring

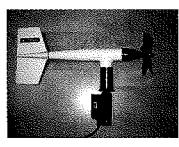



- Field calibration
 - Pre-installation
 - Post-installation

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Wind Monitoring

- Site selection criteria
- Measured at 10 meters
- Variables
 - Maximum, 3-second
 - Minimum, 3-second
 - Mean, 5-minute




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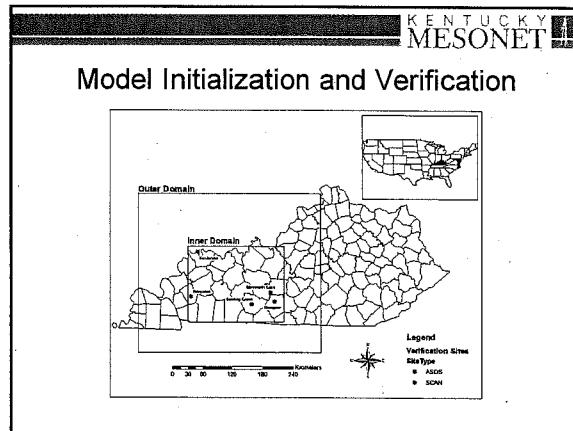
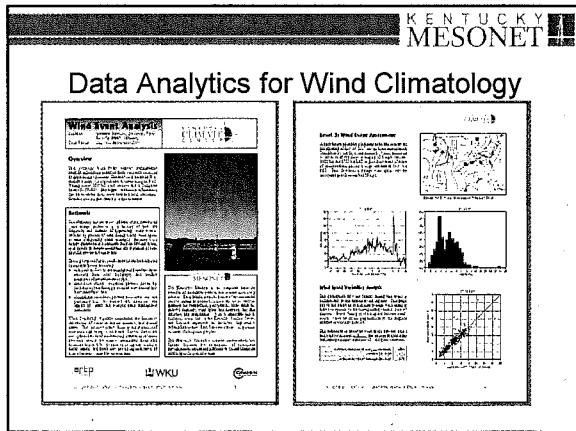
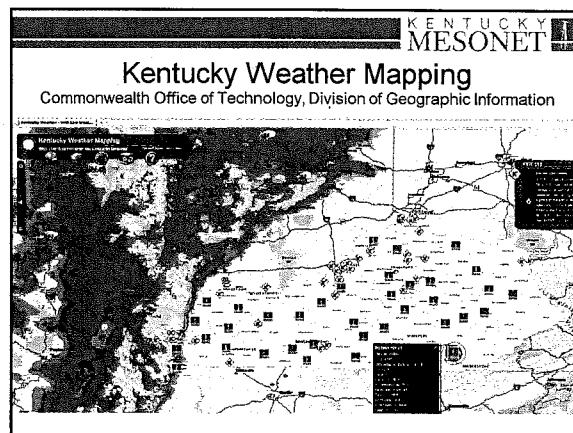
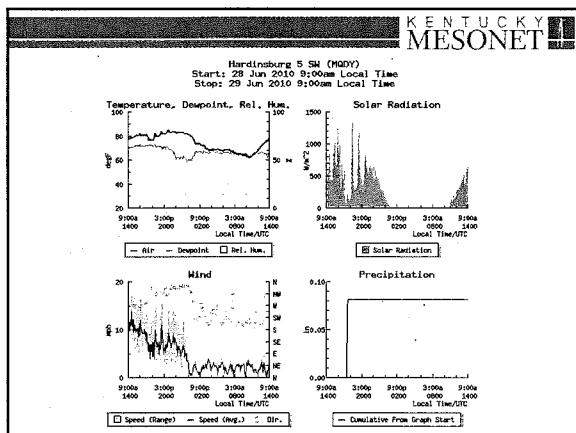
Station Installation and Maintenance

- Technicians install stations and instrumentation
- Technicians make spring, summer, and winter maintenance passes
- Technicians respond to "trouble tickets" when QA processes indicate problems

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Information Technology

- Efficient and reliable communications for collecting environmental data
- Integrated databases for meteorological data and system metadata
- Thorough quality assurance and quality control procedures
- Flexible systems for delivering data and information products



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Model Applications

- Meso-scale Models
 - WRF
 - MM5
 - RAMS
- Application scenarios
 - Forecasting
 - Event analysis
 - Climate change

